1    THE HONORABLE RICHARD A. JONES

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8                    **UNITED STATES DISTRICT COURT**

9              **WESTERN DISTRICT OF WASHINGTON**

10                         **AT SEATTLE**

11   CITY OF SEATTLE, a municipal          Case No. 2:16-CV-00107-RAJ
     corporation, located in the County of
12   King, State of Washington,            **DEFENDANTS' *DAUBERT***
                                           **MOTION TO EXCLUDE THE**
13                         Plaintiff,      **EXPERT TESTIMONY OF**
                                           **LISA RODENBURG**
14          v.
                                           **Noted for: August 26, 2022**
15   MONSANTO COMPANY, SOLUTIA
     INC., and PHARMACIA                   **Oral Argument Requested**
16   CORPORATION,

17                         Defendants.

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DEFENDANTS' *DAUBERT* MOTION TO EXCLUDE
THE EXPERT TESTIMONY OF LISA RODENBURG
CASE NUMBER: 2:16-cv-00107-RAJ

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1    On August 4, 2022, counsel for Defendants and counsel for Plaintiff met and

2  conferred on the substance of this motion but did not reach an agreement.

3  **I.    INTRODUCTION**

4    Monsanto challenges the admission of certain opinions from Plaintiff's retained

5  expert, Lisa A. Rodenburg, Ph.D. ("Rodenburg"). Rodenburg is Plaintiff's expert on the

6  issue of PCB product identification. (*See* Rodenburg *Seattle* Rpt., attached as Ex. A of

7  DeBord Decl.).[1] Rodenburg is being offered at trial for only one opinion: that a high

8  percentage ("in most cases, greater than 95% of the total") of the PCBs found in the

9  Lower Duwamish Waterway ("LDW") were manufactured by Monsanto (known as

10  "Aroclors") as opposed to those created by other manufacturers and those created through

11  today inadvertently—*i.e.*, "byproduct" PCBs that are unintentionally created through

12  hundreds of manufacturing processes involving heat, carbon and chlorine, or by simple

13  combustion/incineration. (*Id.* at 3; *see also* Rodenburg *Seattle* Dep. 49:19-22, Ex. B of

14  DeBord Decl.; Rodenburg *Spokane* Dep. 43:6-14, 51:4-6, 57:12-58:25, 61:4-63:25, Ex. C

15  of DeBord Decl.; Rodenburg *San Diego* Dep. 18:21-25:5, Ex. D of DeBord Decl.).

16    Monsanto does not challenge Rodenburg's qualifications or opinions concerning

17  the presence and ubiquity of byproduct PCBs within the environment, including her

18  opinion that byproduct PCBs are the "main problem" facing municipalities like the City

19  of Seattle, having been detected in numerous bodies of water (including those in

20  Washington State) in excess of federal water quality standards. (Rodenburg *San Diego*

21  Dep., Ex. D 24:14-21, 44:5-21, 57:12-58:15; Rodenburg *Seattle* Dep., Ex. B 58:18-59:12,

22  66:23-67:6). Monsanto likewise does not challenge Rodenburg's opinions that: (1)

23  byproduct PCBs are found in numerous consumer products at concentrations of up to

24  2,500 ppm—14,705,882,352.94 times greater than the 0.00017 µg/L water quality

25  standard for the State of Washington under WAC 173-201A-240; (2) byproduct PCBs

26  from one cereal box can contaminate a volume of water past the federal water quality

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28  [1] All exhibits in support of this *Daubert* Motion to Exclude the Testimony of Lisa Rodenburg as attached
to the accompanying Declaration of Lisa DeBord ("DeBord Decl.").

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1    standard; or (3) of the 209 individual PCB compounds (called "congeners"), at least 130

2    are produced unintentionally through manufacturing processes.  (Rodenburg *Seattle* Dep.,

3    Ex. B. 53:6-18, 122:3-9; Rodenburg *Spokane* Dep., Ex. C 16:10-18:20; Rodenburg *San*

4    *Diego* Dep., Ex. D 28:6-34:4, 37:6-18, 55:15-56:5).

5            Monsanto does challenge, however, the ultimate conclusion that Rodenburg was

6    hired to reach—that Aroclors are the "dominant" sources of PCBs in the LDW

7    (Rodenburg *Seattle* Rpt., Ex. A at 3)—as this opinion is based on unreliable data and a

8    methodology that is not generally accepted in the scientific community.  As will be

9    demonstrated, Rodenburg employed various statistical sleights of hand which rigged her

10   analyses to ensure environmental sampling data would resemble Aroclor rather than

11   byproduct PCB sources unrelated to Defendants.  Rodenburg's opinions should therefore

12   be excluded—or at least limited—for three distinct reasons.  *First*, in forming her

13   opinions, Rodenburg relied extensively (in certain instances, more than 96%) on

14   environmental sampling data that was taken from *outside of the LDW*—and is therefore

15   not representative of conditions *within* the LDW.  *Second*, Rodenburg compared

16   sampling data, or "fingerprints," to sets of data and conditions that do not exist in the real

17   world, but rather, exist only in a counter-reality Rodenburg created to reinforce her

18   opinions.  *Third*, when determining the strength of comparison between environmental

19   fingerprints and patterns of Aroclor and byproduct PCB sources, Rodenburg employed

20   numerical cutoff values of her own creation which:  (1) are scientifically arbitrary and

21   indefensible; (2) have never been subjected to peer-review; and (3) are contradicted by

22   authoritative literature that Rodenburg cites favorably outside this lawsuit.

23   **II.    LEGAL STANDARD**

24           Rule 702's gatekeeping authority vested in courts ensures an expert's testimony

25   "rests on a reliable foundation." *Daubert v. Merrell Dow Pharms. Inc.*, 509 U.S. 579, 597

26   (1993) ("*Daubert I*"). A district court must first determine "nothing less than whether the

27   experts' testimony reflects scientific knowledge, whether their findings are derived by the

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1  scientific method, and whether their work product amounts to good science." *Daubert v.*

2  *Merrel Dow Pharms. Inc.,* 43 F.3d 1311, 1315 (9th Cir. 1995) ("*Daubert II*").

3      *Daubert* "demands a searching inquiry as to method." *United States v. Webb*, 115

4  F.3d 711, 716 (9th Cir. 1997). "[A]ny step that renders the analysis unreliable . . . renders

5  the expert's testimony inadmissible." *Goebel v. Denver & Rio Grande W. R.R.*, 346 F.3d

6  987, 992 (10th Cir. 2003) (citations and internal quotation marks omitted). Testimony

7  that requires "too great an analytical gap between the data and the opinion offered" is

8  impermissible. *General Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997) (citation omitted).

9  When considering the reliability of expert testimony, a trial court should evaluate

10  whether "the theory or technique employed by the expert" (1) is "generally accepted in

11  the scientific community[,]" (2) has been "subjected to peer review and publication[,]"

12  (3) "can be and has been tested[,]" and (4) whether "the known or potential rate of error

13  is acceptable." *Daubert II*, 43 F.3d at 1316-17 (citing *Daubert I*, 509 U.S. at 593-595).

14  **III.    ARGUMENT**

15      Rodenburg used two statistical tools—Positive Matrix Factorization ("PMF") and

16  Multiple Linear Regression ("MLR")—in an attempt to determine whether environmental

17  sampling data was more similar to an Aroclor versus a byproduct PCB source.

18  (Rodenburg *Seattle* Report, Ex. A at 10, 23; Rodenburg *Seattle* Dep., Ex. B 77:22-78:16).

19  As part of the PMF analysis, sampling data is loaded into a computer program that then

20  generates "factors" or "fingerprints," which represent PCB patterns within the data.

21  (Rodenburg *Seattle* Dep., Ex. B 82:9-21; Rodenburg *Spokane* Dep., Ex. C 127:24-

22  128:12).  Next, in an attempt to identify the PCB source, Rodenburg compared the PMF

23  factors to Aroclor and byproduct patterns both visually and using MLR.  (Rodenburg

24  *Seattle* Dep., Ex. B 83:8-25, 87:5-88:20, 307:11-22).  The MLR analysis measures the

25  strength of comparison between the sampling fingerprint and the Aroclor or byproduct

26  pattern, and results in an output called an "$r^2$" [r-square] value, which Rodenburg then

27  interpreted based on various cutoff values of her own subjective creation.  (*Id.* at 85:25-

28  86:7).  As discussed in turn below, Rodenburg's relies on unreliable data and engaged in

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1   various data manipulations which rigged her analyses to ensure that sampling data would

2   look like Aroclor, rather than byproduct PCBs.

3          **A.**        **The Data Underlying Rodenburg's Opinions are Unreliable**

4          Rodenburg's opinions are confined to the presence and purported source of PCBs

5   within the LDW, which consists of river miles ("RM") 0.0 to 5.0 of the Duwamish River.

6   (Rodenburg *Seattle* Dep., Ex. B 91:19-92:19, 96:2-10).  However, the vast majority of

7   data which Rodenburg relied upon to form her opinions—up to 96% for certain

8   environmental compartments—was obtained from environmental samples taken from

9   *outside* the LDW area at issue.  (*See, e.g.*, Rodenburg *Seattle* Rpt., Ex. A at 19 (of the 201

10  surface water samples, only "10 were from RM 3.3, within the LDW"); *see also id.* at 18

11  (only 4.1% of sediment samples (6 out of 146 total) were taken from within the LDW);

12  Rodenburg *Seattle* Dep., Ex. B 109:4-7, 110:4-9).  Indeed, the data underlying

13  Rodenburg's analyses were derived from a study of the larger Green-Duwamish

14  Watershed (the "GD study"), which extends to RM 95.0—more than 90 miles outside of

15  the LDW.  (Rodenburg *Seattle* Dep., Ex. B 80:12-81:12, 98:4-11, 99:13-101:6; *see also*

16  Leidos (2016), Ex. E to DeBord Decl. at 13, 15).  As a result, Rodenburg does not know

17  whether the data she relied on are representative of the LDW, or instead, merely represent

18  the condition of specific sites *outside* of the LDW where the data were collected at the

19  relevant time.

20         Remarkably, Rodenburg did not undertake any analysis to determine whether data

21  from *outside* the area at issue was representative of actual conditions *within* the LDW.

22  (Rodenburg *Seattle* Rpt., Ex. A at 4; Rodenburg *Seattle* Dep., Ex. B 311:7-312:20).  It is

23  anticipated Plaintiff will argue that data from outside of the LDW is relevant to

24  Rodenburg's opinions due to the purported "tidal" nature of the waterway.  However,

25  Rodenburg admits that she did not include any such analysis in her expert report for this

26  case.  (Rodenburg *Seattle* Dep., Ex. B 312:13-20).  Moreover, publications concerning

27  the GD study—which Rodenburg incorporates by reference into her own report,

28  (Rodenburg *Seattle* Rpt, Ex. A at 3)—specifically note that the authors "relied on verbal

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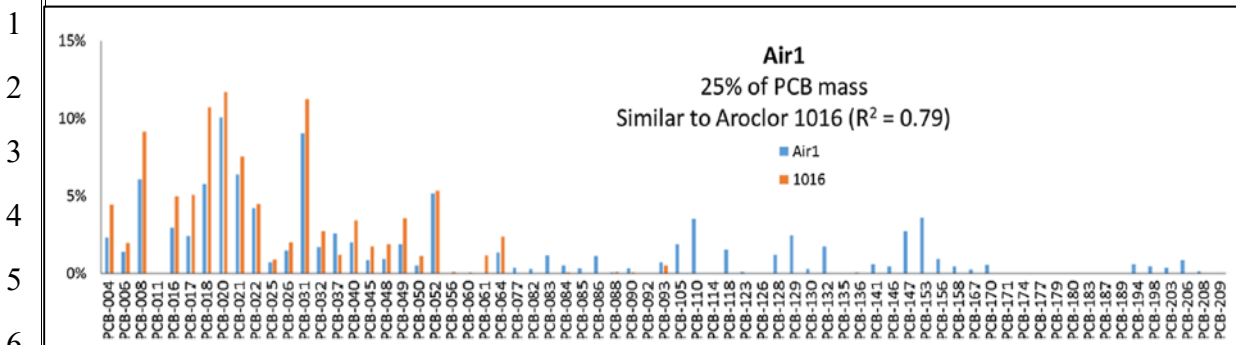St. Louis, MO 63105
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1   and written information provided by secondary sources" and "made no independent

2   investigations concerning the accuracy or completeness of the information relied upon."

3   (Leidos (2016), Ex. E at PDF 2).

4          Rodenburg's inability to vouch for the accuracy or representativeness of the data

5   she relies on renders her opinions and methodology unreliable.  *See* Fed. R. Evid. 702 (b)

6   (expert testimony must be based on "sufficient facts or data"); *Waskowski v. State Farm*

7   *Mut. Auto. Ins. Co.*, 970 F. Supp. 2d 714, 723 (E.D. Mich. 2013) (excluding opinions

8   which are not "based on sufficient facts or data" where damages expert failed to consider

9   data representative of damages at issue, and based estimates on representations made by

10  third parties) (citations omitted).  Because the data underlying her opinions are unreliable,

11  Rodenburg's opinions should be excluded from trial.  *Daubert II*, 43 F.3d at 1317-18; *see*

12  *also Goebel*, 346 F.3d at 992.  At the very least, Rodenburg's opinions should be

13  confined to those concerning data obtained from *within* the LDW.

14          **B.      Rodenburg's Methodology Inaccurately Describes Conditions Within**

15                  **The LDW**

16          In an attempt to identify the source of PCBs within sampling data, Rodenburg

17  compared PMF factors to Aroclor and byproduct patterns both visually and using MLR.

18  (Rodenburg *Seattle* Dep., Ex. B 83:8-25, 87:5-88:20, 307:11-22).  The Aroclor and

19  byproduct patterns that Rodenburg selected for comparison, however, do not reflect real-

20  world conditions, and instead, assume that sampling data is comprised entirely of either:

21  (1) Aroclors or a mixture of Aroclors; or (2) byproduct PCBs from either silicone or

22  pigments.  (Rodenburg *Seattle* Dep., Ex. B 223:10-15).  These comparisons—which

23  exclude the possibility that sampling data is comprised of a mixture of Aroclors *and*

24  byproduct sources—do not accurately reflect the sampling data at issue, which indicate

25  the presence of numerous byproduct PCB congeners within samples that Rodenburg

26  attributes *solely* to an Aroclor source, *e.g.*:

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Reproduced from Rodenburg (2019), Ex. F to DeBord Decl. at 192.

This figure, which is incorporated by reference into her report, depicts Rodenburg's comparison of sampling data from "Air1" (blue bars) with Aroclor 1016 (orange bars). (Rodenburg *Seattle* Dep., Ex. B 229:10-25, 236:18-25). Individual PCB congeners are listed on the x-axis, and their respective concentrations within the sampling data are represented by the height of each bar. (*Id.* at 138:11-20). Despite the fact that Aroclor 1016 does not account for the presence of PCBs 77 through 209 within the sampling dataset, Rodenburg attributes the entirety of "Air1" to an Aroclor source. (*Id.* at 237:19-239:2; Rodenburg *Seattle* Rpt., Ex. A at 4, 18). While Rodenburg posits that PCBs can become "weathered" over time, thus changing their chemical makeup, she admits that the higher chlorinated congeners (*i.e.,* those further to the right on the bar chart) could not form as a result of environmental weathering of lower chlorinated congeners (*i.e.,* those further to the left on the bar charts) present in Aroclor 1016. (Rodenburg *Seattle* Dep., Ex. B 89:6-10, 237:19-239:2; Rodenburg *Spokane* Dep., Ex. C 146:10-24). Rodenburg is thus unable to explain the presence of these higher-chlorinated congeners within the sampling data, and instead, excludes them entirely from her analysis.

Rodenburg's analysis is akin to facial recognition software that determines the strength of comparison based solely on the composition of one's nose, rather than simultaneously considering additional facial features, including the eyes, lips, chin, ears, etc. By failing to consider whether sampling data is comprised of a mixture of Aroclor and byproduct PCB sources, Rodenburg's methodology excludes at least 30% of the PCB

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1    mass present in Air1 (the blue bars between congeners 77 and 209)—including numerous

2    byproduct congeners.  (Rodenburg *Seattle* Dep., Ex. B at 234:24-236:12, 238:6-239:2).

3    Rather than attempt to explain the presence of these congeners within the sampling data,

4    Rodenburg simply ignores them and attributes the entirety of Air1 to an Aroclor source.

5    (*Id.* at 240:10-15).

6            In other instances, Rodenburg excludes up to 50% of the PCB mass within

7    sampling data before attributing that data solely to an Aroclor source.  (*See, e.g.*,

8    Rodenburg *Seattle* Dep., Ex. B at 243:16-244:13 (one half of the PCB mass in

9    "Sediment1"—which Rodenburg attributes entirely to an Aroclor source, Ex. A at 18—

10   cannot be explained by Aroclor 1016)).  Rodenburg's arbitrary exclusion of data contrary

11   to her ultimate conclusion renders her methodology unreliable.  *Abarca v. Franklin Cty.*

12   *Water Dist.*, 761 F. Supp. 2d 1007, 1066 at n.60 (E.D. Cal. 2011) ("[A] reliable expert

13   would not ignore contrary data, misstate the findings of others, [or] make sweeping

14   statements without support[.]") (citation omitted); *Henricksen v. ConocoPhillips Co.*, 605

15   F. Supp. 2d 1142, 1153-54 (E.D. Wash. 2009) ("The court need not admit an expert

16   opinion that is connected to the underlying data 'only by the ipse dixit of the expert.'")

17   (quoting *Joiner*, 522 U.S. at 146).

18           These methodological flaws are exacerbated by the fact that Rodenburg excluded

19   additional byproduct PCB mass from her analyses under the guise of a "data validation"

20   step completed before running her PMF program.  This process admittedly resulted in the

21   removal of byproduct PCB mass—including PCB 11, which is "virtually absent in

22   Monsanto's Aroclors."  (Rodenburg *Seattle* Rpt., Ex. A at 5, 14; Rodenburg *Seattle* Dep.,

23   Ex. B 120:19-121:2).  Rodenburg admits that she excluded from her analyses sampling

24   data comprised of more than 78% byproduct PCBs.  (Rodenburg *Seattle* Dep., Ex. B

25   193:21-194:3).  In total, Rodenburg excluded 40% of the aggregate PCB mass from

26   surface water data, 24% from groundwater data, 55% from otter scat data, 12% from air

27   deposition data, 8% from storm drain data, 6% from sediment data and 4% from tissue

28   data.  (*Id.* at 198:18-22, 199:5-200:15, 201:9-13, 205:25-206:5).  By arbitrarily excluding

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1    byproduct PCB mass from her PMF analyses, Rodenburg's methodology undercounts

2    byproduct and overstates Aroclor contributions to the LDW.  (*Id.* at 210:4-22).

3         Rodenburg further understates byproduct contributions to the LDW by

4    considering only 4 congeners (PCBs 11, 206, 208 and 209) and two sources (silicon and

5    pigment) of byproduct PCBs, despite admitting that more than 130 individual congeners

6    contained within hundreds of consumer products have been identified as byproduct in

7    nature.  (Rodenburg *Seattle* Dep., Ex. B 53:11-18, 59:10-12, 122:3-9, 153:13-154:6,

8    224:3-9, 229:5-9, 256:5-8; *see also* Rodenburg *Spokane* Dep., Ex. C 43:6-14, 51:4-6,

9    132:16-23; Rodenburg *San Diego* Dep., Ex. D 35:8-37:18).  Indeed, Rodenburg admits

10   that, by considering only 4 out of 130 potential byproduct congeners, her methodology

11   could result in an undercounting of byproduct PCB sources within the LDW.

12   (Rodenburg *Seattle* Dep., Ex. B 264:15-265:4).  Rodenburg further admits that she failed

13   to consider byproduct sources—such as asphalt—that were "certainly . . . used

14   throughout the [LDW]."  (*Id.* at 252:18-253:15; *id.* at 251:16-252:7 (Rodenburg failed to

15   consider byproduct sources including caulking, joint compounds, motor vehicle fluid,

16   asphalt and deicer)).  It is only by ignoring these sources and limiting her byproduct

17   analysis to just 4 out of 130 congeners that Rodenburg is able to offer opinions that >99%

18   of an environmental compartment (*e.g.*, tissue) is attributable to an Aroclor source,

19   despite the presence of byproduct congeners within the sampling dataset.  (Rodenburg

20   *Seattle* Rpt., Ex. A at 4, 20; *see also* Rodenburg *Seattle* Dep., Ex. B 259:4-22, 261:15-

21   262:4).

22        Because she failed to consider the full mass of byproduct sources to the LDW,

23   and ignored data contrary to the opinions she was retained to offer, Rodenburg's opinions

24   are not the product of a reliable methodology, and they should be excluded at trial.

25   *Abarca*, 761 F. Supp. 2d at 1066; *Henricksen*, 605 F. Supp. 2d at 1153.  At the very least,

26   Rodenburg's opinions should be limited to those based on a comparison of sampling data

27   to a mixture of Aroclor and all relevant byproduct PCB sources and congeners found

28   within the LDW.

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1      **C.     Rodenburg's $r^2$ Cutoff Values are Unreliable and Scientifically**

2      **Indefensible**

3          In addition to performing a visual comparison, Rodenburg used MLR to

4   determine whether PMF factors were more similar to Aroclor versus byproduct PCB

5   patterns found in silicon and pigment.  (Rodenburg *Seattle* Dep., Ex. B 78:4-16, 87:5-14).

6   The MLR generates an $r^2$ value ranging from zero to 1.0.  (*Id.* at 88:14-20).  Rodenburg

7   then interpreted the $r^2$ values using numerical cutoff values of her own creation which:

8   (1) are scientifically arbitrary and indefensible; (2) have never been subjected to peer-

9   review; and (3) are contradicted by authoritative literature that Rodenburg cites

10  favorably.[2]

11          According to Rodenburg, an $r^2$ value of 0 to 0.4 indicates that sampling data

12  contained a highly weathered Aroclor or a non-Aroclor source; 0.4 to 0.8 indicates a

13  weathered Aroclor; and 0.8 to 1.0 indicates a single unweathered Aroclor.  (Rodenburg

14  *Seattle* Dep., Ex. B 88:21-91:9).  These cutoffs, however, have never been published in

15  any handbook, textbook or peer-reviewed article.  (Rodenburg *Spokane* Dep., Ex. C

16  135:12-136:2, 139:12-16).  Instead, they were contrived entirely by Rodenburg, who

17  concedes that she cannot scientifically disprove the use of $r^2$ cutoff values different than

18  those she selected for her analyses.  (*Id.* at 138:18-139:11).  In fact, a published study that

19  Rodenburg cites favorably used different $r^2$ values, requiring a value of 0.9 or greater to

20  determine whether a sample contained PCBs, and rejecting an $r^2$ value of 0.725 as

21  insufficient.  (*Id.* at 140:2-142:2; *see also* Rodenburg *Seattle* Rpt., Ex. A at 24 (citing

22  Burkhard and Weininger (1987)).

23          Critically, had Rodenburg employed an $r^2$ cutoff of 0.9 to signify the presence of

24  Aroclor PCBs, only 21.4% (9 out of 42)[3] of the environmental compartments Rodenburg

25  considered would have been deemed to acceptably resemble Aroclors.  (*See* Rodenburg

26

27  [2] As with her visual inspection, Rodenburg's MLR also failed to consider whether environmental sampling
data was best explained by a mixture of Aroclor and byproduct sources.  (Rodenburg *Seattle* Dep., Ex. B

28  223:10-15).
    [3] The compartments are: Air5, Sed3, Sed5, Water 4, StormD1, StormD5, StormW1, StormW5, and GW4.

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1  Demonstrative, Ex. G to DeBord Decl. (Rodenburg *Seattle* Dep., Ex. 33) (providing $r^2$

2  values across various environmental compartments considered by Rodenburg); *see also*

3  Ex. B at 301:21-302:3).  This figure is in stark contrast to Rodenburg's opinion that "in

4  most cases, greater than 95%" of the total PCBs in the LDW are Aroclors.  (Rodenburg

5  *Seattle* Rpt., Ex. A at 3).  Nevertheless, Rodenburg employed arbitrary $r^2$ cutoff values

6  favorable to the conclusion she was hired to reach—that Aroclors are the "dominant"

7  sources of PCBs in the LDW.  (*Id.*)

8      Because her MLR analyses are based on quantitative cutoffs that are arbitrary,

9  scientifically indefensible, and have never been subjected to peer review, Rodenburg's

10  opinions do not reflect "scientific knowledge" and should therefore be excluded from

11  trial.  *Whisnant v. United States*, No. C03-5121, 2006 WL 2861112, at *3 (W.D. Wash.

12  Oct. 5, 2006), *aff'd*, 274 F. App'x 536 (9th Cir. 2008) ("[T]he party presenting the expert

13  must show that the expert's findings are based on sound science, and this will require

14  some objective, independent validation of the expert's methodology."); *Henricksen*, 605

15  F. Supp. 2d at 1162.  Alternatively, Rodenburg's opinions should be confined to those

16  based on $r^2$ values which have been subjected to peer review, or are otherwise generally

17  accepted within the scientific community.

18  **IV.    CONCLUSION**

19      For the foregoing reasons, Rodenburg's opinions do not meet the standard for

20  expert opinions mandated by *Daubert* and should therefore be excluded from trial under

21  Rule 702.  At the very least, Rodenburg's opinions should be limited to those which are

22  derived: (1) from data obtained *within* the LDW; (2) through a comparison of sampling

23  data with mixtures of both Aroclor and all relevant byproduct PCB sources and

24  congeners; that is (3) interpreted using $r^2$ cutoff values that have been subjected to peer

25  review or are otherwise generally accepted within the scientific community.

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DEFENDANTS' *DAUBERT* MOTION TO EXCLUDE
THE EXPERT TESTIMONY OF LISA RODENBURG     10
CASE NUMBER: 2:16-cv-00107-RAJ

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